

Sample Stormwater Pollutant Characterization and Response

The following text was prepared by **James R. Wayman, P. E., P. L. S.; Wayman and Associates, Inc.**; 1543 West Tipton Street; Seymour, IN 47274; phone (812) 522-6707; fax (812) 522-9516 for a commercial office building in Seymour, IN. The text is a good example of the type and scope of information necessary for compliance with the requirements in 327 IAC 15-5. This information has been provided with Mr. Wayman's permission. The text should not be copied verbatim for other projects, although it may be utilized as a guide to the level and type of information necessary to satisfy plan content requirements in the rule.

Pollutant Characterization during Construction Phase SP3

The project site, during the construction phase, will consist of several areas of construction activities for which the Contractor assumes responsibility for scheduling, implementing and completing, to provide the Owner with a complete project that contains the elements shown on these Civil plans (C100 series of drawings). These construction activities will involve the delivery, temporary storage, handling and assembly of various materials, as well as the movement, temporary storage, handling and final placement of materials such as topsoil, fill, and vegetation (trees, brush and grasses) already located onsite.

Most of the materials used for construction at this site, whether manufactured products brought to the site or natural and man-made materials already on the site, have the potential for becoming pollutants if they are not stored, handled and installed in a manner that minimizes that potential. The equipment used to handle and install materials, such as internal combustion engine driven equipment, saws, and drills, can also produce pollutants. Packaging materials can also be a source of pollutants.

The following categories list some of the potential pollutant sources associated with the construction activities at this site:

1. Construction equipment: fuel, oil, antifreeze, grease, and brake fluid from internal combustion engine equipment; dust created by driving equipment across dry, dirty surfaces; small debris created by operations such as cutting, sawing or drilling.
2. Construction materials: siltation of soil resulting from earthmoving, rainfall, or tracking by vehicles; waste created by cutting, sawing and drilling operations.
3. Construction material packaging: cardboard boxes, wood crates and pallets; cellophane used to wrap boxes on pallets; styrofoam and other materials used to cushion materials in boxes; bags used to hold small parts.

Material Handling and Spill Prevention Plan for Construction Activities

In order to minimize the release of potential pollutants during construction the Contractor shall implement a material handling and spill prevention plan. The following items, as a minimum, shall be included in the Contractor's plan. The Contractor shall review this plan with all subcontractors and require that they implement the plan as well.

1. Construction Equipment

- a. Fueling, lubrication and fluids: All operations involving the addition of fluids to equipment should be done in one location so that spills are limited to one location on the site, which will facilitate the cleanup of spills. This location should be an area that will not allow spilled fluids to migrate into subsurface soils, preferably a hard surface or a compacted stone area. In the event of a spill, the fluid shall immediately be cleaned up by removing the contaminated soil or stone which shall be disposed of in an acceptable manner. Spills on hard surfaces shall be soaked up by an acceptable material such as Oil Dry and the absorbent material disposed of in a proper manner. The spill shall also be reported immediately to the Contractor's superintendent.
- b. Equipment repair, especially when fluids must be removed from the equipment or the possibility of fluid spills is high, should always be done offsite at a facility that is more suitable than a construction site to handle spills. When equipment must be repaired onsite it should be moved to the fueling area if possible. Otherwise, suitable containers should be placed under the equipment during repair to catch any spilled fluids and these fluids should be disposed of in a proper manner.
- c. All reusable fluid containers, such as gasoline cans, shall be inspected for leaks each time they are used. If leaks are found, the fluid shall be removed from the container in a proper manner and the container disposed of in an acceptable manner. Empty disposable containers, such as grease tubes and lubricating oil and brake fluid containers, and their packaging, shall be disposed of in a proper manner and shall not be left on the ground or in the open on the construction site.

2. Construction Materials and their Packaging

- a. Erosion control measures shown on these plans shall be implemented prior to and during construction in the proper sequencing to minimize soil erosion. Erosion controls shall be inspected and maintained as described elsewhere in these plans. Excessive dusting of soil on the site shall be minimized by reducing construction traffic across bare soil during dry and/or windy weather, and by applying water or other acceptable dust control measures to the soil. Upon completion of construction and suitable establishment of permanent vegetation, temporary erosion control measures such as silt fence, check dams and inlet protection devices shall be removed in a manner to minimize additional land disturbance. Any areas disturbed by these operations shall be properly revegetated.
- b. Large waste materials created by cutting, sawing, drilling, or other operations shall be properly disposed of in suitable waste containers. The site shall be checked at the end of the day, as a minimum, and all waste materials, including those blown across or off the site by wind, shall be picked up and disposed of in suitable containers. Where possible, operations such as sawing that create small particles should be performed in one spot in an area protected from wind, and waste particles collected and disposed of frequently to minimize wind dispersal.
- c. Packaging used to transport materials to the site for construction of the facility shall be disposed of properly, whether the material is taken out of its package and incorporated into the project immediately or stored onsite for future use. Packaged materials stored

onsite shall be inspected regularly and any loose packaging shall be repaired or disposed of properly.

POLLUTANT CHARACTERIZATION FOR POST CONSTRUCTION SP3

THE PROJECT SITE, WHEN THIS PHASE IS COMPLETED, WILL CONSIST OF A SINGLE-STORY OFFICE BUILDING OF ABOUT 21,500 SQUARE FEET AND ASSOCIATED SIDEWALKS, DRIVES, AND PARKING AREAS. STORM RUNOFF FROM THE BUILDING AND A MAJORITY OF THE PARKING AND DRIVE AREAS RUNS TO THE DETENTION AREA IN THE SOUTHWEST CORNER OF THE SITE.

THE EXPECTED POLLUTANTS TO BE GENERATED BY THIS SITE SHOULD BE TYPICAL OF AN OFFICE BUILDING COMPLEX. SOME OF THOSE SOURCES INCLUDE FLUIDS FROM AUTOMOBILES LIKE OIL, GREASE, FUEL, ANTIFREEZE, AND BRAKE FLUID, PLUS PARTICULATES CREATED BY OR CARRIED ON VEHICLES AND DEPOSITED ON THE SITE SUCH AS BRAKE DUST, RUBBER FRAGMENTS FROM TIRES, AND DIRT PICKED UP FROM OR CARRIED ONTO THE SITE. IN ADDITION, TRASH GENERATED BY BUILDING OCCUPANTS OR BLOWN ONTO THE SITE MAY BE FOUND AT TIMES. THERMAL POLLUTION MAY ALSO OCCUR DURING RAINFALL EVENTS WHEN THE BUILDING ROOF OR ASPHALT PAVEMENT ARE HOT FROM SIGNIFICANT SUNLIGHT PRIOR TO THE RAINFALL.

THE POST CONSTRUCTION MEASURES USED TO MINIMIZE SEDIMENTATION IN WATERWAYS INCLUDE SWALES (IN THE MINIMAL CURB OPTION), AND A DETENTION POND THAT WILL COLLECT RUNOFF FROM THE BUILDING AND A MAJORITY OF THE PAVEMENT. THE SWALES IN THE MINIMAL CURB OPTION PICK UP RUNOFF FROM THE MAIN ACCESS DRIVE AND RUN IT TO INLETS NEAR THE STREET. THESE SHALLOW, FLAT SWALES WILL ALLOW SEDIMENT TO SETTLE OUT BEFORE STORMWATER REACHES THE PIPES. BEEHIVE INLETS WILL PREVENT LARGE ITEMS FROM ENTERING THE STORM PIPES AND LEAVING THE SITE. UNDERDRAINS BELOW THE SWALES WILL HELP DRY OUT THE SWALES AFTER A RAIN EVENT AND WILL PROVIDE SOME FILTRATION OF STORMWATER. THE DETENTION BASIN, WHICH IS DESIGNED TO HAVE WATER IN IT AT ALL TIMES, WILL ALSO HELP REDUCE SEDIMENT AND TRASH BY ALLOWING IT TO DROP OUT PRIOR TO LEAVING THE SITE. THE OWNER ALSO DESIRES TO KEEP SOME OF THE OPEN PART OF THE SITE UNDISTURBED DURING AND AFTER CONSTRUCTION, ALLOWING EXISTING VEGETATION TO FILTER OUT SEDIMENT DURING AND AFTER CONSTRUCTION. THE OWNER HAS COMMITTED TO DEVELOPING THIS SITE WITH MINIMAL DUSTURBANCE TO THE EXISTING WOODS AT ANY TIME.

THERMAL POLLUTION WILL BE MINIMIZED BY TWO METHODS – REDUCING THE AMOUNT OF TIME THAT WATER IS IN CONTACT WITH WARM SURFACES AND RUNNING MOST OF THE WATER THAT DOES CONTACT WARM SURFACES THROUGH THE DETENTION POND. THE DRIVE IS CROWNED TO GET WATER OFF THE PAVEMENT AND TO THE SWALES AS QUICKLY AS POSSIBLE. THE OTHER PAVEMENT AREAS AND THE BUILDING DRAIN TO THE DETENTION ARE WHERE THE WATER ALREADY IN THE POND CAN REDUCE THERMAL LOAD. IN ADDITION, THE OWNER PLANS TO INSTALL A

FOUNTAIN IN THE POND (NOT SHOWN ON THESE PLANS) WHICH WILL REDUCE WATER TEMPERATURE IN THE POND.

THE POST CONSTRUCTION STORMWATER QUALITY MEASURES WILL BE INSTALLED EARLIER IN THE CONSTRUCTION PHASE, WEATHER PERMITTING. EXCAVATION OF THE DETENTION POND WILL BE DONE EARLY TO PROVIDE FILL FOR OTHER AREAS ON THE SITE. STORM PIPES WILL BE INSTALLED AS SOON AS PRACTICAL – HOWEVER, EXTREMELY POOR SOILS ONSITE WILL REQUIRE SUBSTANTIAL IMPROVEMENT BY STABILIZATION OR REMOVAL, WHICH MAY DELAY STORM PIPE INSTALLATION.

MAINTENANCE GUIDELINES FOR POST CONSTRUCTION MEASURES

MAINTENANCE OF ALL STORMWATER POLLUTION PREVENTION MEASURES WILL BE THE RESPONSIBILITY OF THE PROJECT OWNER, AISIN HOLDINGS OF AMERICA. THE MAINTENANCE GUIDELINES CONSIST MOSTLY OF GOOD HOUSEKEEPING MEASURES. ANY GRASSED OR VEGETATED AREAS THAT EXPERIENCE EROSION FROM RAINFALL EVENTS SHOULD BE REPAIRED AND REVEGETATED AS SOON AS POSSIBLE. TRASH OR LITTER SHOULD BE PICKED UP AND PROPERLY DISPOSED TO PREVENT IT FROM GETTING INTO THE STORM DRAINAGE SYSTEM AND DOWNSTREAM WATERWAYS.

EROSION OF THE DETENTION POND BANKS SHOULD BE ADDRESSED AS SOON AS IT BECOMES VISIBLE BY FILLING THE ERODED AREA WITH SUITABLE SOIL AND ESTABLISHING VEGETATION IMMEDIATELY, PREFERABLY BY SODDING, OR BY SEEDING AND MULCHING AND MONITORING UNTIL SUITABLE VEGETATION IS ESTABLISHED. THE SAME MEASURE SHOULD BE USED FOR STEEP BANKS OF THE EARTH BERMS OR ANY OTHER STEEP AREA. THE DETENTION POND SHOULD ALSO BE MONITORED FOR SEDIMENT COMING FROM THE STORM DRAINAGE SYSTEM. IF THE BOTTOM OF THE POND RECEIVES SEDIMENT IT SHOULD BE CLEANED OUT AND THE SOURCE FOUND AND REPAIRED. THE ELEVATION OF THE POND BOTTOM SHOULD BE CHECKED EVERY 8 TO 10 YEARS AND, IF SIGNIFICANT SEDIMENT IS ENCOUNTERED, IT SHOULD BE REMOVED FROM THE BASIN. THIS SHOULD BE DONE DURING PERIODS OF LOW RAINFALL TO ALLOW SOIL STIRRED UP BY EXCAVATION TO SETTLE OUT BEFORE A RAIN EVENT. THE DETENTION POND OUTLET SHOULD ALSO BE PROTECTED BY ADEQUATE FILTRATION (ROCK CHECK DAM AS SHOWN ON THESE PLANS, OR OTHER SUITABLE MEASURE) TO PREVENT SOIL FROM ENTERING THE OFFSITE STORM DRAINAGE SYSTEM.

PAVEMENT AREAS SHOULD ALSO BE MONITORED FOR POLLUTANTS. ANY LARGE QUANTITY OF FLUIDS SUCH AS OIL, ANTIFREEZE, BRAKE FLUID, ETC. FOUND ON THE PAVEMENT SHOULD BE REPORTED TO THE OFFICE AND THE SOURCE DETERMINED, IF POSSIBLE, AND REMOVED FROM THE SITE FOR MAINTENANCE OR REPAIR. PAVEMENTS SHOULD ALSO BE MONITORED FOR SEDIMENT COMING FROM VEGETATED AREAS THAT DRAIN ONTO THE PAVEMENT. IF SEDIMENT IS FOUND IT SHOULD BE CLEANED OFF THE PAVEMENT, AND THE SOURCE OF THE SOIL FOUND AND REPAIRED AS DISCUSSED ABOVE.